

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Original) A hydraulic system for use in a hydrostatic transmission comprising in combination:

 a variable displacement main pump;

 a hydraulic motor;

 a hydraulic circuit operatively interconnecting said main pump and said motor including a first line connecting a first port within said main pump to a first port within said hydraulic motor and a second line connecting a second port within said main pump to a second port within said hydraulic motor;

 a charge pump operatively connected to said circuit and a reservoir; and

 wherein said variable displacement pump has:

 a first input passage fluidly connected to said hydraulic circuit first line;

 a second input passage fluidly connected to said hydraulic circuit second line;

 an output passage fluidly connected to a pump case drain line that leads to said reservoir;

 a valve bore integrated within said pump in fluid communication with said first input passage, said second input passage and said output passage, for receiving a hot oil shuttle valve;

 said hot oil shuttle valve including a valve spool, adapted for sealing movement within said spool bore, having a first end portion, a second end portion, and a connecting portion having a cross sectional area smaller than that of the first and second end portions and in fluid communication with at least a portion of said output passage at all times, said valve spool being longitudinally movable, via fluid pressure, within said spool bore from

a neutral position to one of a first and second position, wherein the fluid pressure forces, acting on the first and second end portions, are approximately equal in said valve spool neutral position, the fluid pressure forces acting on said first end portion being greater than the fluid pressure forces acting on said second end portion in the first position, and the fluid pressure forces acting on said first end portion being less than the fluid pressure forces acting on said second end portion in the second position, said second input passage communicating hot oil fluid to said output passage while said valve spool is in said first position and said first input passage communicating hot oil fluid to said output passage while said valve spool is in said second position.

Claim 2 (Currently amended) A hydraulic system for use in a hydrostatic transmission comprising in combination:

a main pump;

a hydraulic motor;

a hydraulic circuit operatively interconnecting said main pump and said motor including a first line connecting a first port within said main pump to a first port within said hydraulic motor and a second line connecting a second port within said main pump to a second port within said hydraulic motor;

a charge pump operatively connected to said circuit and a reservoir; and

wherein an improvement comprises said main pump is a variable displacement pump having an integrated hot oil shuttle valve for diverting a portion of fluid flowing through said hydraulic circuit to said reservoir.

Claim 3 (Cancelled)

Claim 4 (Currently amended) The hydraulic system in claim 3 2 wherein said hot oil shuttle valve diverts fluid from said second line to said reservoir when the pressure in said first line is greater than the pressure in said second line and diverts fluid from said first line to said reservoir when the pressure in said first line is less than the pressure in said second line.

Claim 5 (Currently amended) The hydraulic system in claim 3 2 wherein said pump has a case with at least one orifice for connection with a case drain line.

Claim 6 (Currently amended) The hydraulic system in claim 3 2 wherein said motor is a two-stage motor.

Claim 7 (Currently amended) The hydraulic system in claim 3 2 wherein said hot oil shuttle valve takes the form of a spool valve.

Claim 8 (Original) A hydraulic pump for a closed-loop hydrostatic transmission circuit having an integrated shuttle valve for diverting hot fluid from said hydrostatic transmission circuit to a reservoir, said circuit operatively interconnecting said hydraulic pump with a motor.

Claim 9 (Original) The hydraulic pump as in claim 8 wherein said circuit includes a first line connecting a first port within said hydraulic pump to a first port within said motor and a second line connecting a second port within said hydraulic pump to a second port within said motor.

Claim 10 (Original) The hydraulic pump in claim 9 wherein said shuttle valve is housed within a bore in said pump, said bore is fluidly connected to a first passage, a second passage and a third passage, said first passage is fluidly connected to said first line in said closed-loop hydrostatic transmission circuit, said second passage is fluidly connected to said second line in said closed-loop hydrostatic transmission circuit, said third passage is fluidly connected to a case drain line connecting said pump to said reservoir, said first passage has fluid flow therethrough when the pressure in said first line is less than the pressure in said second line, said second passage has fluid flow therethrough when the pressure in said second line is less than the pressure in said first line, said third line has fluid flow therethrough when either the pressures in said first and second lines are not equal.

Claim 11 (Original) The hydraulic pump in claim 9 wherein said shuttle valve is housed within a bore in said pump and can reciprocatingly move from a centered position, in which the pressure in said first line is equal to the pressure in said second line, to a first position, in which the pressure in said first line is greater than the pressure in said second line, and a second position, in which the pressure in said first line is less than the pressure in said second line.

Claim 12 (Original) The hydraulic pump as in claim 11 wherein the hot fluid passes from said second line to said reservoir for cooling when said shuttle valve is in said first position and the hot fluid passes from said first line to said reservoir for cooling when said shuttle valve is in said second position.

Claim 13 (Original) The hydraulic pump as in claim 8 wherein said motor is a two-pressure stage motor.

Application No.: 10/807,602
Amendment dated: January 3, 2006
Reply to Office Action of September 9, 2005
Docket No.: 2802-107-025

Claim 14 (Original) The hydraulic pump as in claim 8 wherein said hydraulic pump is a variable displacement pump.